Health Canada Santé Canada

Your health and safety... our priority. *Votre santé et votre sécurité... notre priorité.*

Re-evaluation Decision RVD2012-08

MCPB

(publié aussi en français)

17 October 2012

This document is published by the Health Canada Pest Management Regulatory Agency. For further information, please contact:

Publications
Pest Management Regulatory Agency
Health Canada
2720 Riverside Drive
A.L. 6604-E2
Ottawa, Ontario K1A 0K9pmra.infoserv@hc-sc.gc.ca

Internet: pmra.publications@hc-sc.gc.ca
healthcanada.gc.ca/pmra
Facsimile: 613-736-3758
Information Service:
1-800-267-6315 or 613-736-3799

Canada

ISSN: 1925-1017 (print)
1925-1025 (online)

Catalogue number: H113-28/2012-8E (print version)
H113-28/2012-8E-PDF (PDF version)

© Her Majesty the Queen in Right of Canada, represented by the Minister of Health Canada, 2012

All rights reserved. No part of this information (publication or product) may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or stored in a retrieval system, without prior written permission of the Minister of Public Works and Government Services Canada, Ottawa, Ontario K1A 0S5.

Table of Contents

Re-evaluation Decision 1
What Does Health Canada Consider When Making a Re-evaluation Decision? 1
What is MCPB? 2
Health Considerations 2
Environmental Considerations 4
Value Considerations 5
Measures to Minimize Risk 6
What Additional Information is Being Requested? 7
Other Information 7
Appendix I Comments and Responses 9
Appendix II M/L/A Short-Intermediate Term Applicator Exposure and Risk Assessment 17
Appendix III Restricted Entry Intervals for Commercial Post-Application Activities After One Application 19
Appendix IV Label Amendments for Products Containing MCPB 21
References 29

Re-evaluation Decision

After a thorough re-evaluation of the herbicide 4-(4-Chloro-2-methylphenoxy) butanoic acid (MCPB), Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act* and Regulations, is granting continued registration of products containing MCPB for sale and use in Canada.

An evaluation of available scientific information found that products containing MCPB have value in the food and crop industry and do not pose unacceptable risks to human health or the environment when used according to label directions. As a condition of the continued registration of MCPB uses, new risk-reduction measures must be included on the labels of all products. In addition, registrants are required to submit confirmatory data identified in this document.

The regulatory approach for the re-evaluation of MCPB was first presented in Proposed Re-evaluation Decision PRVD2011-06, *MCPB*, a consultation document[1]. This Re-evaluation Decision[2] describes this stage of the Agency's decision and the reasons for it. Comments received during the consultation process did result in changes to the proposed regulatory decision as described in the PRVD. A summary of these comments and the PMRA's responses to them appear in Appendix I. To comply with this decision, registrants of products containing MCPB will be informed of the specific requirements affecting their product registration(s).

What Does Health Canada Consider When Making a Re-evaluation Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions or proposed conditions of registration[3]. The Act also requires that products have value[4] when used according to the label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

To reach its decisions, the PMRA applies hazard and risk assessment methods as well as policies that are rigorous and modern. These methods consider the unique characteristics of sensitive subpopulations in both humans (for example, children) and organisms in the environment (for example, those most sensitive to environmental contaminants). These methods and policies also consider the nature of the effects observed and the uncertainties present when predicting the

---

1 "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*

2 "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

3 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act*.

4 "Value" as defined by subsection 2(1) of the *Pest Control Products Act*: "the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (a) efficacy; (b) effect on host organisms in connection with which it is intended to be used; and (c) health, safety and environmental benefits and social and economic impact".

impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the PMRA portion of Health Canada's website at www.pmra-arla.gc.ca.

What is MCPB?

MCPB is a selective systemic broadleaf herbicide. It belongs to the phenoxy acid family and is classified as a Group 4 herbicide. This herbicide mimics the natural plant hormone indole-3-acetic acid (also known as auxin), thereby causing susceptible broadleaf weeds to be controlled. MCPB is registered for the post-emergence control of annual and perennial broadleaf weeds in terrestrial food crops, terrestrial feed crops and industrial oil seed crops and fibre crops. The rate of application of MCPB ranges from 1.031 to 1.594 kg a.i./ha. It is applied once per year. MCPB is available only in Commercial Class products and can be applied by ground and/or aerial equipment.

Health Considerations

Can Approved Uses of MCPB Affect Human Health?

MCPB is unlikely to affect human health when used according to revised label directions.

Potential exposure to MCPB may occur through diet, when handling and applying the product, or when entering or contacting treated sites. When assessing health risks, two key factors are considered: the levels at which no health effects occur in animal testing and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive human population (for example, pregnant women, nursing mothers and children). Only the uses for which exposure is well below levels that cause no effects in animal testing are considered acceptable for continued registration.

Toxicology studies in laboratory animals describe potential health effects from varying levels of exposure to a chemical and identify the dose at which no effects are observed. The health effects noted in animals occur at doses more than 100 times higher (and often much higher) than levels to which humans are normally exposed when products containing pesticides are used according to label directions.

MCPB is of moderate acute oral toxicity, low acute dermal toxicity, and slight acute inhalation toxicity in laboratory animals. MCPB is non-irritating to the skin, moderately irritating to the eyes and is not a dermal sensitizer.

The most sensitive endpoint for non-pregnant animals from the oral route of exposure is kidney toxicity. Test data indicated that MCPB is not likely to be carcinogenic or mutagenic in humans.

When MCPB is administered to pregnant rats and rabbits, reduced skeletal ossification and increased incidences of cranio-facial malformations are observed. Due to the nature of the effects and their potential implications on the health and survival of the fetus, extra protective factors are applied during the risk assessment to further reduce the allowable level of human exposure to MCPB.

With the proposed mitigation measures, the risk assessment protects against these effects by ensuring that the level of human exposure is well below the lowest dose at which these effects occur in animal tests.

Residues in Water and Food

Dietary risks from food and water are not of concern.

Reference doses define levels to which an individual can be exposed over a single day (acute) or lifetime (chronic) and expect no adverse health effects. Generally, dietary exposure from food and water is acceptable if it is less than 100% of the acute reference dose (ARfD) or chronic reference dose (acceptable daily intake). An acceptable daily intake (ADI) is an estimate of the level of daily exposure to a pesticide residue that, over a lifetime, is expected to have no significant harmful effects.

Dietary exposure to MCPB was estimated from residues in treated crops and drinking water for different subpopulations representing different ages, genders and reproductive status. Acute and chronic exposure estimates were determined for the general population and all subpopulations including females of child-bearing age (13 to 49 years old), infants and children.

The aggregate acute exposure (i.e. to MCPB from food and drinking water) represents 39% of the acute reference dose for females 13 to 49 years old and is in the range of 1 to 5% of the acute reference dose for all the other population subgroups when using drinking water concentrations generated from water modelling. The aggregate chronic exposure represents 5% of the chronic reference dose for the general population and is in the range of 4 to 10% of the chronic reference dose for all subpopulations. Thus, acute and chronic aggregate risks are not of concern.

The *Food and Drugs Act* prohibits the sale of adulterated food; that is, food containing a pesticide residue that exceeds the established maximum residue limit (MRL). Pesticide MRLs are established for *Food and Drugs Act* purposes through the evaluation of scientific data under the *Pest Control Products Act*. Each MRL value defines the maximum concentration in parts per million (ppm) of a pesticide allowed in or on certain foods. Food containing a pesticide residue that is at or below the established MRL does not pose an unacceptable health risk.

MRLs in/on all commodities treated with MCPB are currently regulated under B.15.002(1) of the Food and Drug Regulations which requires that residues do not exceed 0.1 ppm. Details regarding MRLs for MCPB can be found in the Science Evaluation Section of PRVD2011-06.

Risks in Residential and Other Non-Occupational Environments

Residential and other non-occupational risks are not of concern.

MCPB is not registered for use in residential areas. Therefore, a non-occupational risk assessment was not required.

Occupational Risks from Handling MCPB

Occupational risks for handlers are not of concern when used according to the revised label directions.

Based on the precautions and directions for use on the original product labels reviewed for this re-evaluation, the risk assessment for mixing/loading and application activities indicate that target margins of exposure (MOEs) are achieved for all crops, provided that risk mitigation measures are applied. The MOEs for mixing/loading and application reach target MOEs for pastures, cereals (wheat, oats, barley and rye), seedling alfalfa, seedling clover, field corn, seedling grasses, and peas (succulent/processing and dry/field) with the addition of mitigation measures including the use of additional protective equipment and engineering controls. In some scenarios, limiting the amount of kilograms handled per day by each worker will be necessary. Please refer to Appendix II for a summary of the calculations.

Occupational post-application risks are not of concern when used according to the revised label directions.

Occupational post-application risk assessments consider exposure to workers entering treated agricultural sites. Based on the precautions and directions for use on the original product labels reviewed for this re-evaluation, post-application risks to workers meet current standards and are not of concern for all crops. A restricted entry interval (REI) set at 12 hours for most crops will mitigate any risk from exposure for post-application workers entering an area that has been treated with MCPB. For field corn, the REI is 9 days for scouting. This REI is considered to be agronomically feasible due to the timing of application. Please refer to Appendix III for a summary of the calculations.

Environmental Considerations

What Happens When MCPB is Introduced Into the Environment?

MCPB poses a risk to terrestrial broadleaf plants, birds, small wild mammals and aquatic organisms including macrophyte plants and amphibians; therefore, additional risk-reduction measures need to be observed.

MCPB can enter non-target terrestrial habitats by drift from aerial or ground application such as pasture use, and it can enter aquatic habitats by run-off and leaching. It is water soluble and can move through the soil profile horizontally and vertically, thereby contaminating ground water and surface water, including drinking water sources. MCPB does not accumulate or

bioconcentrate in the environment and it is not persistent in soil, having a degradation half-life of 8.3 days depending on the type of soil. In aquatic environments, biotransformation eliminates fifty percent of the chemical in less than 18 days, and degradation by sunlight in surface water can be even more rapid.

Because of the specific mode of action affecting broadleaf plants (MCPB is a synthetic auxin plant hormone similar to other phenoxy herbicides such as 2,4-D), it is highly toxic to terrestrial plants such as trees, shrubs, crops and others. Non-target invertebrates including bees and beneficial insects are not likely to be affected by this chemical. Although vertebrate animals including birds and small wild mammals are not usually affected by MCPB's specific mode of action, some species show slight to moderate toxicity for oral/dietary exposure. In aquatic habitats, fish and invertebrates are not likely to be affected by MCPB based on available data; however, aquatic plants such as duck weed are sensitive.

The use of MCPB poses a risk to terrestrial and aquatic organisms, including plants, birds, mammals, aquatic plants and amphibians. To reduce exposure of terrestrial organisms, environmental hazard label statements are recommended. Terrestrial plants including crops and non-target plant habitats such as shelter belts and riparian zones along streams and ponds can be protected from adverse effects by the observance of specified spray restrictions which provide a spray buffer zone between sites of the application and non-target areas. Furthermore, precautionary label statements will be used to help reduce the potential for surface runoff and for ground water contamination.

Value Considerations

What is the Value of MCPB?

MCPB continues to contribute to weed management in a variety of crops when used in accordance with the label directions.

MCPB is one of the few post-emergent herbicides that control a broad spectrum of annual and perennial broadleaf weeds in peas (succulent/processing and dry/field). MCPB is co-formulated with MCPA to broaden the spectrum of weed control. When formulated with MCPA, it is the only alternative to 2,4-DB registered for use in seedling clovers (wild white, Dutch white, ladino, alsike, and red clovers) alone or with a companion crop (wheat, barley, oats and rye). It is one of the few post-emergent herbicides registered for use in seedling grasses and in seedling alfalfa grown for seed production. Although many herbicides are registered in field corn, MCPB is one of the few that can be applied at a later stage to this crop (up to 60 cm in plant height). MCPB also plays a role in mitigating resistance development in weeds to other herbicide groups when used in rotation with them.

Measures to Minimize Risk

Labels of registered pesticide products include specific instructions for use. Directions include risk-reduction measures to protect human and environmental health. These directions are required by law to be followed. As a result of the re-evaluation of MCPB, the PMRA is requiring further risk-reduction measures for product labels.

Additional Key Risk-Reduction Measures

Refer to Appendix IV for detailed label mitigation measures.

Human Health

- Statements reducing dietary exposure relating to:
  - Pre-harvest and grazing restrictions;
  - Rotational plant back interval.
- To protect workers entering treated fields, REIs are required:
  - Most crops: 12 hours
  - Field corn: 9 days (scouting only)
- Precautionary statements to avoid drift to areas of human habitation or areas of human activity.
- Additional personal protective equipment and engineering controls.
- Limitations on the amount of kg of a.i. handled per day.

Environment

- To reduce release of MCPB into the environment: changes to label statements include measures to reduce spray drift to non-target habitats, and to prevent unintentional contamination of such areas. Also to provide measures to reduce contamination of non-target sites resulting from surface runoff and leaching.
- To protect aquatic habitats: the inclusion of spray buffer zones on the label; i.e. the end-use products may not be sprayed within 1 to 175 metres of aquatic or terrestrial habitats. The specific distance depends on the type of spray equipment and the application rate.

Value

- A maximum of one application is allowed per season when applying products containing MCPB.
- The application rate of 1.751 kg a.i./ha, which is used exclusively on peas (succulent/processing and dry/field), is no longer supported by the registrant and must be reduced to 1.594 kg a.i./ha.

What Additional Information is Being Requested?

Although the risks and value have been found to be acceptable when all risk-reduction measures are followed, additional information is required from registrants as a result of this re-evaluation:

> Recent analytical data from at least five batches of the technical grade active ingredient (TGAI) must be provided for all identifiable dioxins and furans from a GLP-compliant or government-accredited laboratory.
>
> The report should include data for the 17 substances listed in Table 4 of the *Priority Substances List 1* document "Polychlorinated dibenzodioxins and polychlorinated dibenzofurans", found at: www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl1-lsp1/dioxins_furans_dioxines_furannes/index-eng.php.
>
> The analytical method(s) used must utilize the lowest practical limits of quantitation and be fully specified, either by reference to a standard method or by inclusion of a detailed description together with validation data.

Other Information

Any person may file a notice of objection[5] regarding this decision on MCPB within 60 days from the date of publication of this Re-evaluation Decision. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Pesticides and Pest Management portion of Health Canada's website (Request a Reconsideration of Decision) or contact the PMRA's Pest Management Information Service.

[5] As per subsection 35(1) of the *Pest Control Products Act*.

Appendix I Comments and Responses

In response to PRVD2011-06, comments relating to the health risk assessment were received from the MCPB Task Force. Comments have been grouped by content as there were multiple comments relating to the same topic.

1.0 Comments Relating to Health

1.1 Comment – Toxicological Summary

While it is agreed that some changes in clinical chemistry in studies with MCPA are potentially indicative of hepatic involvement, the decreases in plasma triglycerides seen at mid and high dose levels in the rat two-year dietary study are more likely associated with the known properties of the major metabolite, MCPA, as a weak peroxisome proliferator.

Response

It is acknowledged that the decreases in plasma triglycerides seen at mid and high dose levels in the MCPA rat two-year dietary study may be associated with the known properties of MCPA as a weak peroxisome proliferator. However, no mode of action (MOA) rationale or data related to the kinetics of conversion of MCPB to MCPA and the associated impact on triglyceride levels was submitted to support this position. Without an acceptable MOA supporting a lack of relevance of this finding to humans, decreases in plasma triglycerides in both the mid and high doses is considered to be an early indicator of treatment related hepatotoxicity.

It should be noted that acceptance of such an MOA would not impact the existing health risk assessment for MCPB as the toxicological endpoints used for risk assessment were based on the rat acute neurotoxicity and the rabbit developmental toxicity studies.

1.2 Comment – Epidemiology

The findings by Saracci *et al* (1991) were extended in a further communication by Kogevinas *et al* (1995) which showed that in two case-control studies there was association between manufacture of chlorophenoxy herbicides, soft tissue sarcoma and non-Hodgkin's lymphoma. As stated in the PRVD, no specific chemical could be identified as causing this increased risk. However, in a further paper from the same group of epidemiologists (Kogevinas *et al*, 1997), a meta analysis of all data from a combined cohort of almost 22000 workers (from 36 individual cohorts in 12 countries) exposed to phenoxy herbicides and chlorophenols showed that increased incidence of these tumours was confined to the facilities where workers were exposed to phenoxy herbicides contaminated with 2,3,7,8-TCDD and/or higher chlorinated dioxins. Processes which did not produce dioxins did not show the same association. It is part of current specification (confirmed by analysis) that current production of phenoxy herbicides, including MCPB, does not contain significant concentrations of TCDD.

Response

The PMRA acknowledges that the interpretation of epidemiological results for potential cancer effects of the phenoxy herbicides are often confounded by factors such as the general grouping of pesticides, poor quantitative estimation of exposure, and for older studies, contamination of phenoxy pesticides with 2,3,7,8-TCDD and/or higher chlorinated dioxins. TCDD is a recognized human carcinogen and the PMRA agrees that phenoxy herbicides that do not contain significant amounts of TCDD are not likely to represent a cancer risk to populations exposed to phenoxy herbicides. Data to confirm that MCPB produced under current processes do not contain significant concentrations of TCDD have been requested by the PMRA.

1.3 Comment – Rabbit Developmental Toxicity Assay

The MCPB Task Force (TF) noted in their comment, that contrary to what was reported in PRVD2011-06, resorptions by dams in the rabbit developmental toxicity study were comparable to controls. Also contrary to PMRA's evaluation, the MCPB TF believes that the cranio-facial malformations (dome-shaped head and low-set ears) observed at the high dose in the assay were not serious or treatment related. The MCPB TF commented that the incidence of low-set ears was observed in 3 foetuses, two of which had died in utero putting in question the value of these observations. In the case of the observed incidences of dome-shaped head, the MCPB TF commented that it was observed only in small foetuses (i.e., underweight compared to the average foetus) and that a dome-shaped head, in this case is not a significant finding overall. These cranio-facial malformations in addition to the high degree of maternal toxicity observed concurrently leads the MCPB TF to believe that these observed effects are neither serious, nor of major concern.

In addition, the MCPB TF proposes that it is highly probable that the high dose in this study exceeded the renal clearance threshold of the test animals, causing the significant toxic responses observed within the study. A major metabolite of MCPB, MCPA and a related molecule, 2,4 D have been shown to cause significant toxic responses only at doses where the threshold for renal clearance is exceeded. The MCPB TF also notes that gavage dosing, as performed in developmental toxicity studies, increases the probability of exceeding the threshold dose. The MCPB TF believes that it is probable that the high dose in the current study exceeded the renal clearance threshold of the test animals and thus, the results cannot be extrapolated to the low doses achieved in human exposures.

Based on the comments provided, it is the opinion of the MCPB TF that no additional PCPA factor is necessary.

Response

Regarding treatment related increases in resorptions, the PMRA agrees that there was no treatment related increase in resorptions for dams in the rabbit developmental toxicity study.

With respect to the presence of cranio-facial malformations, the PMRA maintains that the observation of dome shaped heads (DSH) and low set ears (LSE) are significant observations that could not be solely attributed to maternal toxicity. In the rabbit developmental toxicity study, there were a total of 5 offspring with LSEs. Two out of 5 were found dead in utero and of the 3 live foetuses, 2 were small but all 3 had DSH, which may be an early precursor to hydrocephaly. No incidences of LSEs or DSHs were seen in concurrent control animals and historical control data were not provided; therefore, the occurrence of these craniofacial malformations was considered a serious treatment related effect in the presence of maternal toxicity. It is noteworthy that hydrocephaly, a serious malformation, was observed in the rat teratogenicity study where animals were exposed to the 2-ethylhexyl ester form of MCPA. That hydrocephaly was observed within the toxicological database, and in another species, further supports the significance of the observed incidences of DSH in the rabbit developmental toxicity study.

There is insufficient data to conclude that MCPB caused renal saturation in the rabbit at the dose where craniofacial malformations were noted. Evidence showing that MCPA/B in the rabbit is excreted by the same saturable renal transporter as 2,4 D in the rat as well as evidence identifying the dose at which non-linearity occurs in the rabbit dosed with MCPA or MCPB would allow for further consideration that the effects observed may have been due to excessive toxicity resulting from saturation of renal clearance in the rabbit.

Because a concern for the seriousness of the observed treatment related effects (DSHs and LSEs) in the presence of maternal toxicity, the 3-fold PCPA factor is retained in the PMRA's risk assessment.

1.4 Comment - Dermal Absorption Factor (DAF)

The MCPB TF submitted a human and rat *in vitro* dermal absorption study during the comment period, and proposed that the ratio between human and rat dermal absorption be used to modify the dermal absorption factor. The main observation was that the rate of penetration of MCPB through the human skin was very slow during the first 4 hours and increased thereafter, which contrasts the trend seen in rat skin.

Response

In PRVD2011-06, dermal absorption values of 75% and 51% were selected based on a rat *in vivo* study (Beimborn and Leibold, 2003). The 75% value was for mixers/loaders/applicators who handle the concentrated formulation of MCPB while the 51% was for the post-application workers. The PMRA reviewed the rat and human *in vitro* dermal absorption study (Davies, 2003) submitted during the comment period and considered it together with the rat *in vivo* study using the Triple-Pack approach as outlined in the NAFTA draft position paper (NAFTA, 2008).

A number of uncertainties and limitations were noted in the *in vitro* dermal absorption study, and it did not meet the minimal standards to use the Triple-Pack approach. However, the data can still be considered as part of a weight-of-evidence approach and were used to refine the dermal absorption factor for MCPB using the *in vitro* study results qualitatively in conjunction with other available data (such as physical-chemical properties of MCPB and international reviews). As residues remaining in the skin are still available for absorption, the PMRA agrees with the

MCPB Task Force that skin bound residues should be included in the dermal absorption estimate, unless data are submitted to characterize the fate of these residues. Using this approach, a dermal absorption factor of 30% was established by PMRA and used to revise the exposure assessment of MCPB.

The risk assessment was revised using the updated dermal absorption factor of 30%; appropriate changes to mitigations, restrictions, scenarios, and the label amendments were made and documented in later responses.

1.5 Comment – MCPA Exposure Study

The MCPB TF indicated that a worker biomonitoring study conducted in Canada with MCPA (Rogers, 1998) and the overview of the study (Bellet, 1998) could be used to refine the occupational risk assessment.

Response

In general, depending on the pharmacokinetics, biomonitoring studies can be used to directly measure exposure to a specific chemical for a particular scenario. Surrogate biomonitoring studies would generally not be acceptable as the toxicokinetics differ from compound to compound, unless adequate pharmacokinetic bridging data are available. In the case of the MCPA biomonitoring study, there were inadequate pharmacokinetic data for both MCPA and MCPB to bridge the two chemicals. The MCPB pharmacokinetic data were not readily available in literature nor provided by the registrant. Based on the results of the dermal absorption studies, which demonstrated different penetration characteristics between MCPA and MCPB, there is uncertainty whether the systemic exposure of MCPA would be representative of MCPB. Since the MCPA exposure study could not be used and a MCPB specific exposure study was not submitted, PMRA will continue to use the PHED database in the risk assessment of MCPB.

1.6 Comment – Area Treated Per Day (ATPD)

Use information including typical application equipment and ATPD values were provided by the MCPB TF to refine the risk assessment.

Response

The use information provided by the MCPB TF was reviewed and taken into consideration in the revised risk assessment. Based on this information, custom application was added for succulent/processing peas and handheld spot treatment scenarios were added for dry/field peas. However, most of the ATPD values could not be refined as these estimates need to encompass the typical range of treatment areas that may be treated by farmer and custom applicators. References were not provided for the ATPD information provided in the PRVD comments. As such, it is unknown what the source of ATPD values in the comments was, what these values represent (for example, 50th percentile, mean, 95th percentile), or how representative these values are of the area treated by farmers and custom applicators across Canada. The ATPD values in the risk assessment were refined as much as possible using the Statistics Canada Census of Agriculture for farm size information and the Statistics on Pesticide Use Database (SPUD),

which was a survey commissioned by the PMRA from across Canada wherein applicators, both farmers and custom, were asked what areas they typically treat in a day with pesticides for specific crop commodities. Although there are limitations to this data, it is the best data available to estimate ATPD.

1.7 Comment - Personal Protective Equipment (PPE)

The description of PPE and clothing under engineering controls should allow for minimal PPE to be used in combination with engineering controls. Accordingly, closed-system mixing/loading should be evaluated with baseline PPE (single layer and protective gloves).

Response

Baseline PPE (single layer consisting of long sleeves and pants and protective gloves) were considered when combined with engineering controls (for example, closed-cab tractors) as well as for closed-system mixing/loading to calculate the Margin of Exposure (MOE); the additional protection afforded by coveralls was required in order to reach the target MOE. Thus, the risk assessment required higher levels of PPE for certain scenarios and are detailed in the mitigation section below and in Appendix IV. The corresponding label changes are also listed in Appendix IV.

PPE is specified based on what is needed to mitigate exposure, with a consideration of what can reasonably be worn while handling and applying the pesticide. PPE requirements are assessed for each exposure scenario and are set at the minimum level necessary to protect human health. Taking into account the concerns of PPE raised by the MCPB Task force, the PMRA will specify two tiers of usage for MCPB applied using groundboom equipment which are detailed further below in this document.

1.8 Comment – PHED vs. AHETF data

The MCPB Task Force requested that PMRA use the AHETF database instead of the Canadian PHED values.

Response

The PMRA is currently reviewing the AHETF data internally and until it is approved for use, PHED data will continue to be used for exposure risk assessments. Preliminary reviews indicate that the unit exposure values derived from AHETF are very similar to values in PHED for the open cab groundboom scenario. Additionally, there are no AHETF data for closed cab groundboom and handheld equipment currently.

1.9 Comment - Mitigation Measures and Label Amendments

The MCPB Task Force commented that the additional worker exposure data and dermal absorption data provided during the comment period could be used to revise the risk assessment. The net effect would be to improve the exposure estimates and reduce the proposed restrictions on crop uses, the levels of PPE and REIs.

Response

As noted above, the mixer/loader/applicator and post-application risk assessments were revised using a 30% dermal absorption factor as well as some of the use information provided during the comment period. As a result of these changes, all scenarios now reach the target MOE with mitigation measures. The resulting revised margins of exposure (MOE) and restricted entry intervals (REIs) are shown in Appendices II and III. The resulting label changes are in Appendix IV.

1.10 Comment - Closed Mixing and Loading Systems

The MCPB TF indicated that requiring closed mixing/loading systems for small farmers would be cost prohibitive and that these types of systems are more common with custom applicators and large scale farmer applicators.

Response

The PMRA acknowledges that closed mixing/loading systems may not be available for all users. Therefore, PMRA will specify two tiers on the label for groundboom scenarios as noted in Appendix IV. The lower amount is geared towards small-scale farm applications while the higher amount is for large-scale farm/custom operations and the corresponding restrictions would apply to all scenarios for all crops/use sites.

1.11 Comment – Uses that are rare: Aerial Application and Field Corn

MCPB herbicides are rarely applied with aerial application equipment. The proposed phase out of aerial application would have no significant practical impact. Also, MCPB herbicides are rarely used in the production of field corn. End-use product registrants would have no objection to removing uses on corn from product labels.

Response

Using the revised 30% DAF, the aerial application and field corn scenarios both reach the target MOE with appropriate PPE and mitigations and thus, these scenarios are acceptable for continued registration. For the aerial scenario, requirements are "mixers/loaders wearing coveralls over a single layer using a closed-filling system and aerial applicators wearing long sleeves and pants." An REI needs to be determined for all label uses where post-application activities are likely to occur as a result of the pesticide application. In the case of field corn, the revised REI is 9 days. It is recommended that the MCPB registrants contact the PMRA should they wish to remove these uses or other uses from the label.

1.12 Comment – Dietary Risk Assessment: Confined Crop Rotation Study

A field dissipation study has recently been completed which shows a rapid dissipation of MCPB and its major metabolites in soils (Panara, 2010). Thus, it can be determined that a confined rotational crop study is not necessary, as it would not supply additional information. Consequently, the restricted label statements on crop rotation should not be required.

Response

The purpose of a confined crop rotational study is to determine the nature and the amount of pesticide residue uptake into a rotational crop. This study should be conducted on representative crops for small grains, root and tuber vegetables, and leafy vegetables. The rotational crop should be planted at appropriate soil aging intervals following application of the radio-labelled pesticide to the soil and analysed at harvest for residues observed in the primary crops. An appropriate rotational crop restriction (plant-back interval) can then be set at the shortest interval where the residue does not exceed 0.01 ppm. The study submitted by the MCPB Task Force is a soil dissipation/accumulation study conducted on bare ground plots. Although the study was conducted at application rates comparable to Canadian rates and in Zone 5A (common to Canada and US) and gives information on the dissipation rate of MCPB in soil, it does not address the potential uptake of MCPB or its environmental degradates into crop matrices, nor does it address the potential translocation and/or metabolism of these residues within the plant. Thus, the submitted data is insufficient to support the removal of the restrictive label statements concerning crop rotation.

2.0 Comments Relating to Environment

2.1 Comment – Section 4.2.1 Risk to Terrestrial Organisms (Page 29, Mammals)

Although the level of concern is not exceeded for small mammals exposed to MCPB, it should be noted that recent studies involving acute dietary administration of MCPA and structurally related phenoxy herbicides to mice has shown that no mortality and no clinical signs of intoxication can be induced at dietary inclusion rates of up to 20,000 ppm, although there is reduced food consumption at the higher levels. This is not unexpected given the known rapid elimination of MCPB in normal metabolism. However, this serves as an illustration that no mammalian toxicity is likely at any contamination rates which may be conceivably derived from field application.

Response

This comment generally supports the PMRA's mammalian risk assessment results. The review did not show a risk to small mammals exposed to MCPB. Although potential risks were identified for some feeding guilds in the medium and large mammal groups when feeding directly on treated fields, these risks are considered acceptable due to the conservative nature of the assessment. Although new information may be available on MCPA and related phenoxy herbicide dietary toxicity to mice, the PMRA does not require the submission of new data at this time.

2.2 Comment - 4.2.2 Effects on Aquatic Organisms (Page 31, Aquatic Plants)

Although the screening level LOC was exceeded for duckweed, this relates to a study performed in 1992. Studies performed with phenoxy herbicides at this time have been shown to produce atypical results. A more recent study conducted to current guidelines (Albuquerque, 2003) gives an EC50 value of 37 mg/l compared to 0.23 mg/l in the 1992 study. This more recent study is considered to be more reliable for an assessment of the environmental impact of MCPB. This aspect has been discussed at some length in papers by Pigott (2006a, b). The new study is being submitted to PMRA simultaneously with these comments via E-Index.

Response

In the case of aquatic plants, it is noted that there is apparent variability in the data for some phenoxy herbicides and species. However, part of this variability can be explained by study design and details. With respect to the *Lemna* studies in question both were conducted following acceptable test guidelines (OECD 202 and EPA FIFRA). While both acceptable, these guidelines differ in several ways including the duration of exposure (14d vs.7d, with longer duration producing lower toxicity endpoints) and the type of endpoint measured. Furthermore, it should be noted that, as indicated in the re-evaluation document for MCPB, the LOC is not exceeded for aerial crop and ground applications and only slightly exceeded for aerial non-crop applications indicating little to no potential risk to aquatic plants using the available data. It is also noted that aquatic plants are not the most sensitive group of aquatic organisms and thus using a different endpoint would not alter the required mitigation measures to protect aquatic habitats. The PMRA acknowledges that there may be variability in data sets; however, given that this endpoint in question is not a risk driver, it sees little value added in choosing a different endpoint for the risk assessment at this point given it will not change the acceptability of the product nor the mitigation measures specified.

Appendix II M/L/A Short-Intermediate Term Applicator Exposure and Risk Assessment

Crop	Scenario	Application Equipment	Form	PPE	Max Rate (g ai/ha)	Area Treated Per Day (ha/day)	Daily Exposure mg/kg/day		Margins of Exposure [c] (Target 300)		Combined MOE [d] (Target 300)	Max Kg ai handled per day to reach target MOE
							Dermal[a]	Inhalation[b]	Dermal	Inhalation		
USC 7 & 13												
Field Corn	Farmer: M/L/A	Groundboom - open mixing & open cab	SN	Mid-level	1590	80	0.029	0.0047	170	1100	150	**62**
	Custom: M/L/A			Mid-level	1590	140	0.051	0.0081	97	610	84	**62**
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Baseline	1590	80	0.016	0.00031	310	16000	300	N/A
	Custom: M/L/A			Mid-level	1590	140	0.013	0.00054	370	9200	360	N/A
USC 13, 14												
Succulent/ Processing Peas	Farmer: M/L/A	Groundboom - open mixing & open cab	SN	Mid-level	1590	40	0.015	0.0023	340	2200	290	N/A
	Custom: M/L/A			Mid-level	1590	100	0.037	0.0058	140	860	120	**62**
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Baseline	1590	40	0.0082	0.00015	610	32000	600	N/A
	Custom: M/L/A			Mid-level	1590	100	0.0096	0.00039	520	13000	500	N/A
Dry/Field Peas	Farmer: M/L/A	Groundboom - open mixing & open cab	SN	Mid-level	1590	100	0.037	0.0058	140	860	120	**62**
	Custom: M/L/A			Mid-level	1590	300	0.11	0.017	45	290	39	**62**
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Mid-level	1590	100	0.0096	0.00039	520	13000	500	N/A
	Custom: M/L/A			Mid-level	1590	300	0.029	0.0012	170	4300	170	**270**
	Farmer: M/L/A **SPOT TREATMENT**	Manually-pressurized Handwand – open pour	SN	Baseline	10.625 g ai/L	150 L/day	0.0064	0.0010	780	4900	670	N/A
		Backpack – open pour	SN	Mid-level	10.625 g ai/L	150 L/day	0.018	0.0014	280	3500	260	**1.4** [e]

Crop	Scenario	Application Equipment	Form	PPE	Max Rate (g ai/ha)	Area Treated Per Day (ha/day)	Daily Exposure mg/kg/day		Margins of Exposure [c] (Target 300)		Combined MOE [d] (Target 300)	Max Kg ai handled per day to reach target MOE
							Dermal[a]	Inhalation[b]	Dermal	Inhalation		
Pastures, Seedling clover, Cereals (wheat, barley, rye, oats)	Farmer: M/L/A	Groundboom - open mixing & open cab	SN	Mid-level	1590	100	0.037	0.0058	140	860	120	62
	Custom: M/L/A			Mid-level	1590	300	0.11	0.017	45	290	39	62
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Mid-level	1590	100	0.0096	0.00039	520	13000	500	N/A
	Custom: M/L/A			Mid-level	1590	300	0.029	0.0012	170	4300	170	270
Pastures, Cereals (wheat, barley, rye,oats)	M/L	Aerial- open mixing	SN	Mid-level	1030	400	0.058	0.0094	86	530	74	100
		Aerial- closed mixing		Mid-level			0.017	0.00065	300	7700	280	N/A
	Applicator	Aerial		Baseline			0.017	0.00041	290	12000	290	N/A
USC 13												
Seedling Grasses	Farmer: M/L/A	Groundboom-open mixing, open cab	SN	Mid-level	1310	100	0.030	0.0048	170	1000	140	62
	Custom: M/L/A			Mid-level		300	0.091	0.014	55	350	48	62
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Baseline	1310	100	0.017	0.00032	300	16000	290	N/A
	Custom: M/L/A			Mid-level		300	0.024	0.00095	210	5200	200	270
USC 13												
Seedling Alfalfa	Farmer: M/L/A	Groundboom-open mixing, open cab	SN	Mid-level	1030	100	0.024	0.0038	210	1300	180	62
	Custom: M/L/A			Mid-level		300	0.071	0.011	70	440	61	62
	Farmer: M/L/A	Groundboom-closed mixing & closed cab	SN	Baseline	1030	100	0.013	0.00025	380	20000	370	N/A
	Custom: M/L/A			Mid-level		300	0.019	0.00075	270	6700	260	270

Shaded cells indicate MOEs are below the range of the target MOE value of 300.

[a] Where dermal exposure µg/kg/day = (unit exposure x volume handled x use rate (g/L) x 30 % dermal absorption)/70 kg bw

[b] Where inhalation exposure µg/kg/day = (unit exposure x volume handled x use rate (g/L))/70 kg bw

[c] Dermal MOE is based on a oral NOAEL of 5 mg/kg/day, target is 300. Inhalation MOE is based on an oral NOAEL of 5 mg/kg bw/day, target is 300.

[d] Calculated using the following equation: Combined MOE = NOAEL /(Exp Dermal + Exp Inhalation)

[e] This value covers off all other spot treatment scenarios in other crops treated with MCPB because this scenario was assessed using the highest registered application rate.

Appendix III Restricted Entry Intervals for Commercial Post-Application Activities After One Application

Crop	Activity	TC (cm^2/hr) [a]	Max Rate (g ai/ha)	DFR ($\mu g/cm^2$) [b]	Max # of App.	Exposure Time (hr/day)	Dermal Exposure (mg/kg bw/day) [c]	Dermal MOE (Day 0) [d] Target = 300	Target DFR ($\mu g/cm^2$) [e]	REI (Days) [f]
Field Corn	Scouting	400	1590	3.18	1	8	0.044	120	1.22	9
Pastures	Scouting	100	1590	3.18	1	8	0.011	460	4.86	12 hours
Seedling Grasses	Scouting	100	1310	2.62	1	8	0.0090	560	4.86	12 hours
Seedling Alfalfa	Scouting	100	1030	2.06	1	8	0.0071	710	4.86	12 hours
Seedling Clover	Scouting	100	1590	3.18	1	8	0.011	460	4.86	12 hours
Peas (succulent/ processing and dry/field)	Scouting, roguing (hand weeding)	100	1590	3.18	1	8	0.011	460	4.86	12 hours
Cereals	Scouting	100	1590	3.18	1	8	0.011	460	4.86	12 hours

Shaded cells indicate MOEs that are less than the target MOE.

[a] Transfer coefficients are from the Science Advisory Council for Exposure Agricultural Transfer Coefficient document (Revised - August 7, 2000b)

[b] Dislodgeable Foliar Residue values were calculated using the standard default of 20% of the application rate for day 0 and 10% dissipation per day thereafter (values shown are for day 0 post-application).

[c] Dermal exposure was calculated using the following equation: TC (cm^2/hr) x Duration (8 hr/day) x DFR ($\mu g/cm^2$) x Dermal Absorption (30%)/ Body Weight (70 kg)

[d] Dermal MOE on Day 0 is the margin of exposure on the day of application. Based on short-intermediate term oral NOAEL of 5 mg/kg bw/day, target MOE is 300.

[e] Target DFR is the level below which dislodgeable foliar residue values need to be in order to reach the target MOE for workers to enter a treated area to perform post-application activities. It is calculated using the following equation:

$$DFR_T \ (\mu g/cm^2) = \frac{\text{NOAEL } (\mu g/kg) \times \text{BW (kg)}}{\text{TC } (cm^2/hr) \times \text{Exposure Time (hrs)} \times \text{Safety Factor (unitless)} \times \text{Derm Abs (30\%)}}$$

[f] A restricted entry interval (REI) is the duration of time which must elapse before residues decline to a level where entry into a treated area to perform a specific activity will result in a margin of exposure above the agency target. The lowest REI permitted for occupational areas is 12 hours.

Appendix IV Label Amendments for Products Containing MCPB

The following label amendments are required for technical, manufacturing and end-use products as applicable.

A) Number of Allowable Applications

A maximum of one application is allowed per season when applying products containing MCPB.

B) Label Changes Relating to Human Health

All labels containing MCPB must include the following text:

> **Toxicological Information**
> High concentrations of MCPB may cause severe irritation to the eyes. Symptoms of overexposure to MCPB could include slurred speech, twitching, jerking and spasms, drooling, low-blood pressure and unconsciousness. Treat symptomatically.

Uses Requiring Mitigation:

- Mitigation measures are required in order to reduce the risk of occupational exposure and labels should be amended to reflect the changes to all MCPB uses: cereals (wheat, barley, oats, and rye), field corn, pastures, seedling grasses, seedling alfalfa, seedling clover, and peas (succulent/processing and dry/field).

Application Rates:

- The application rate of 1.751 kg a.i./ha, which is used exclusively on peas (succulent/processing and dry/field), is no longer supported by the registrant and must be reduced to 1.594 kg a.i./ha.

Use Precautions:

- The following warning statements should appear on all labels:

> WARNING POISON: Harmful or fatal if swallowed
> CAUTION POISON: Harmful if inhaled
> WARNING - Eye irritant: Causes eye irritation, DO NOT get into eyes.

- There may be potential for exposure to bystanders from drift following pesticide application to agricultural areas. In the interest of promoting best management practices and to minimize human exposure from spray drift or from spray residues resulting from drift, the following label statements are required:

> Apply only when the potential for drift to areas of human habitation or areas of human activity (houses, cottages, schools and recreational areas) is minimal.

Take into consideration wind speed, wind direction, temperature inversion, application equipment and sprayer settings.

- In addition, it is recommended that the following statements be added to all labels:

  Do not use in residential areas. Residential areas are defined as sites where bystanders including children may be potentially exposed during or after spraying. This includes around homes, schools, parks, playgrounds, playing fields, public buildings or any other areas where the general public including children could be exposed.

  Not for use in greenhouses.

Personal Protective Equipment & Engineering Controls:

- Additional label statements are required regarding personal protective equipment and engineering controls for the purpose of mitigating the risk of exposure to MCPB and in the interest of maintaining consistency between labels. Spot treatment mitigation has been added to the labels.

Groundboom

Mixers/Loaders/Applicators. There are two tiers for the groundboom scenario:

If handling less than 62 kg of active ingredient in one day, wear a long-sleeved shirt, long pants, shoes plus socks, and chemical resistant gloves. Chemical resistant gloves are not required to be worn during groundboom application but are required for clean-up and repair. According to these provisions, do not handle more than 62 kg of active ingredient in one day (for example, 39 ha at the maximum rate of 1.594 kg a.i./ha). These restrictions are in place to minimize exposure to individual workers. Application may need to be performed over multiple days or using multiple workers.

If handling more than 62 kg active ingredient in one day, use a closed-system for mixing/loading while wearing coveralls over a long-sleeved shirt, long pants, shoes plus socks, and chemical resistant gloves. Also, use a closed-cab that provides both a physical barrier and respiratory protection (i.e. dust/mist filtering and/or vapour/gas purification system). The closed cab must have a chemical resistant barrier that totally surrounds the occupant and prevents contact with pesticides outside the cab. Chemical-resistant gloves are not required to be worn inside the closed cab, but have them ready for leaving the cab during calibration, repair or cleaning of equipment. According to these provisions, do not handle more than 270 kg of active ingredient in one day (for example, 170 ha at the maximum rate of 1.594 kg a.i./ha). These restrictions are in place to minimize exposure to individual workers. Application may need to be performed over multiple days or using multiple workers.

For PCP Registration Number 5937, add the following text:

62 kg a.i./day/person is equivalent to 150 L of product/day/person at maximum rate.

270 kg a.i/day/person is equivalent to 655 L of product/day/person at maximum rate.

For PCP Registration Numbers 8211, 22003, 24336, 26488, and 29582, add the following text:

62 kg a.i./day/person is equivalent to 165 L of product/day/person at maximum rate.

270 kg a.i/day/person is equivalent to 720 L of product/day/person at maximum rate.

Spot treatment

Mixers/Loaders/Applicators. Using manually-pressurized handheld equipment:

Wear coveralls over a long-sleeved shirt, long pants, shoes plus socks, and chemical resistant gloves. Do not handle more than 1.4 kg of active ingredient in one day (for example, 0.9 ha at the maximum rate of 1.594 kg a.i./ha). These restrictions are in place to minimize exposure to individual workers. Application may need to be performed over multiple days or using multiple workers.

For PCP Registration Number 5937, add the following text:

1.4 kg a.i./day/person is equivalent to 3 L of product/day/person at maximum rate.

For PCP Registration Numbers 8211, 22003, 24336, 26488, and 29582, add the following text:

> 1.4 kg a.i./day/person is equivalent to 4 L of product/day/person at maximum rate.

Aerial

Mixers/Loaders:

> Use a closed-system for mixing/loading while wearing coveralls over a long-sleeved shirt, long pants, shoes plus socks, and chemical resistant gloves.

Applicators:

> Wear a long-sleeved shirt, long pants, and shoes plus socks.

Post-Application Label Statements – Restricted Entry Intervals (REI):

- Labels must be amended to reflect the REIs that reduce the risk for post-application workers:

> Cereals, pastures, seedling alfalfa, seedling clover, seedling grasses, peas (succulent/processing and dry/field):
> An REI of 12 hours after application is required to perform post-application activities in treated areas.
>
> Field corn:
> An REI of 9 days after application is required to perform post-application activities (scouting) in treated areas.

Statements Reducing Dietary Exposure:

- When used on barley, oats, rye, wheat, field corn, peas (succulent/processing and dry/field), pastures and seedling grasses:

> Do not permit lactating dairy animals to graze fields within 7 days after application.
> Do not harvest forage or cut hay within 7 days after application.
> Withdraw meat animals from treated fields at least 3 days before slaughter.

- When used on seedling clover:

> Do not permit lactating dairy animals to graze fields within 30 days after application.
> Do not harvest forage or cut hay within 30 days after application.
> Withdraw meat animals from treated fields at least 3 days before slaughter.

- A minimum rotational crop plant back interval (PBI) of 12 months must be observed for all crops other than those registered for use with MCPA or MCPB.

C) Label Changes Relating to Environment

All Products

Add to **ENVIRONMENTAL HAZARDS**:

Toxic to aquatic organisms, birds and small wild animals.

TOXIC to non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

For Commercial Products

Surface runoff
To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application when heavy rain is forecast.

Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Leaching
The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow.

Add to **DIRECTIONS FOR USE:**

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. Boom height must be 60 cm or less above the crop or ground.

Aerial application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply when wind speed is greater than 16 km/h at flying height at the site of application. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length **MUST NOT** exceed 65% of the wing- or rotorspan.

Buffer zones:
Use of the following spray methods or equipment **DO NOT** require a buffer zone: hand-held or backpack sprayer and spot treatment.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands), sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) and estuarine/marine habitats.

Method of application	Crop		Buffer Zones (metres) Required for the Protection of:		
			Aquatic Habitat of Depths:		Terrestrial habitat
			Less than 1 m	Greater than 1 m	
Field sprayer	Peas, barley, field corn, oats, rye, seedling clover, wheat (spring and durum), seedling grasses, pasture and seedling alfalfa for seed		1	0	3*
Aerial	Barley, oats, rye, wheat (spring and durum) and pasture	Fixed wing	1	0	175
		Rotary wing	1	0	125

* For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy, the labelled buffer zone can be reduced by 30%.

For tank mixes, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

D) Label Changes Relating to Value

Label revision for PCP Registration Number 5937:

In the **DIRECTIONS FOR USE** section, under the heading CROPS – TIMES AND RATES OF APPLICATION, the APPLICATION RATE paragraph, second line to third line which reads "DO NOT exceed 4.25 L/ha" must be revised to read "DO NOT exceed 3.87 L/ha".

In the **DIRECTIONS FOR USE** section, under the heading SUSCEPTIBILITY OF WEEDS TO TROPOTOX SELECTIVE WEEDKILLER LIQUID HERBICIDE:

a) Under ANNUALS:

For the SUSCEPTIBLE WEEDS section, first line which reads "USE 3.5 – 4.25 L/ha" must be revised to read "USE 3.5 – 3.87 L/ha".

For the MODERATELY SUSCEPTIBLE WEEDS section, "USE 4.25 L/ha" must be revised to read "USE 3.87 L/ha".

b) Under PERENNIALS:

For the SUSCEPTIBLE WEEDS section, "USE 4.25 L/ha" must be revised to read "USE 3.87 L/ha".

For the MODERATELY SUSCEPTIBLE WEEDS section, "USE 4.25 L/ha" must be revised to read "USE 3.87 L/ha".

References

NOTE: This list includes additional references considered after the publication of PRVD2011-06 that contributed to this final re-evaluation decision.

A) List of Studies/Information Submitted by Registrant(s)

PMRA#	Reference
2115788	Agricultural Reentry Task Force (ARTF). 2008. Data Submitted by the ARTF to Support Revision of Agricultural Transfer Coefficients.
1550927	Beimborn, D. B. and Leibold, E., (2003). ^{14}C-MCPB – Study of the Dermal Absorption in Rats. Experimental Toxicology and Ecology BASF Aktiengesellschaft D-67056 Ludwigshafen/Rhein, Germany. Laboratory Project# 01B0416/026012. Unpublished.
2042416	Davies, D.J., (2003) MCPB 400 g/L Formulation: *In Vitro* Absorption Through Human and Rat Epidermis. Central Toxicology Laboratory, Cheshire, UK. Study Number JV1717. Unpublished.

B) Additional Information - Published

Kogevinas, M., Kauppinen, T., Winkelmann, R., Becher, H., Bertazzi, P.A., Bueno-de-Mesquita, H.B., Coggon, D., Green, L., Johnson, E., Littorin, M., Lynge, E., Marlow, D.A., Mathews, J.D., Neuberger, M., Benn, T., Pannett, B., Pearce, N., and Saracci, R. (1995) Soft Tissue Sarcoma and Non-Hodgkin's Lymphoma in Workers Exposed to Phenoxy Herbicides, Chlorophenols and Dioxins: Two Nested Case-Control Studies. Epidemiology. Vol. 6, No. 4, 396-402.

Kogevinas, M., Becher, H., Benn, T., Bertazzi, P.A., Bofefetta, P., Mesquita, H.B., Coggon, D., Colin, D., Flesch-Janys, D., Fingerhut, M., Green, L., Kauppinen, T., Littorin, M., Lynge, E., Mathews, J.D., Neuberger, M., Pearce, N., and Saracci, R. (1997) Cancer Mortality in Workers Exposed to Phenoxy Herbicides, Chlorophenoxl and Dioxins – An Expanded and Updated International Cohort Study. American Journal of Epidemiology. Vol. 145, No. 12, 1061-1075

Sandberg, J.A., Duhart, H.M., Lipe, G., Binienda, Z., Slikker Jr., W. and Kim C.S. (1996) Distribution of 2,4-dichlorophenoxyacwetic acid (2,4-D) in Maternal and Fetal Rabbits, Journal of Toxicology and Environmental Health. 49:497-509.

Statistics Canada. 2006. Census of Agriculture. Ottawa, Ontario. June 2006. (http://www.statcan.gc.ca/pub/95-629-x/2007000/4123856-eng.htm)